Agrometeorology for a climate smart agriculture.

Anna Dalla Marta¹, Federica Rossi², Robert Stefansky³

¹DISPAA - University of Firenze, Italy ²CNR IBIMET- Italy ³Chief Agricultural Meteorology Division, WMO

...agricultural strategies to secure sustainable food security under climate change

sustainably increasing productivity and incomes



strengthening resilience to climate change



reducing contribution to climate change





CSA overlaps with the concepts of sustainable agriculture and disaster risk reduction, and some CSA techniques, such as rainwater harvesting, have been practised in many countries for centuries...

So ... what's new?





1. The emphasis on climate change: CSA systematically integrates climate change into the planning and development of sustainable agricultural systems. CSA is sustainable agriculture that incorporates resilience concerns while at the same time seeking to reduce GHG emissions.

- Responding to three challenges at the same time: for that, CSA must focus on outcomes, synergies and trade-offs between productivity, adaptation and mitigation
- 2. New funding opportunities: by focusing on climate change, CSA allows the sector to tap into climate finance for adaptation and mitigation

Source: adapted from https://csa.guide/csa

How agrometeorology is related to climate smart agriculture?









Conference Summary and Recommendations

Robert Stefansky Chief Agricultural Meteorology Division

International Conference on Promoting Weather and Climate Information for Agriculture and Food Security

- Develop advisories which use climate parameters as triggers for selection between alternative farm interventions which optimize production and sustainability of the systems (climate based solutions!)
- Consider C and water footprint
- Create communities made up of researchers, knowledge providers, meteorologists, agronomists, extensions services, farmers, politicians, etc.

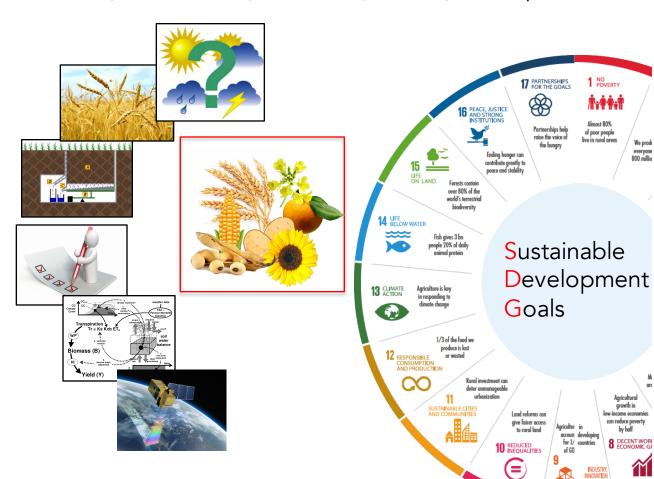
The scenario: a growing international concern about agriculture to cope with climate change and variability.

The needs: to produce more – and good-food for a growing population with less. To reduce footprints, to make agriculture a climate-smart activity.

How to manage: enhance resilience, reduce vulnerability to cc, increase sustainability and resource-efficiency, promote mitigation, mostly for heavily managed crops.

Agrometeorology

To bring to farmers operational science-based support tools





Agrometeorology and the Sustainable Development Goals

- C stock
- GHG emissions
- Adaptation
- Biodiversity conservation
- Resilience
- Income
- Sustainability
- Food security
- Economic growth



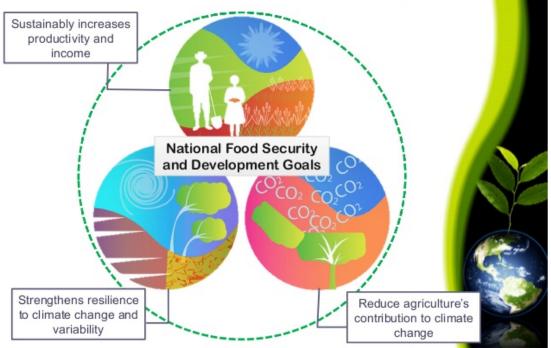


Inclusive, voluntary, actionoriented multi-stakeholder platform on CSA



Aims to catalyze and create transformational partnerships to promote the 3 pillars of CSA

Addresses the challenges facing food security and agriculture by tapping the wealth and diversity of resources, knowledge, information and expertise, from and between its members, in order to stimulate concrete initiatives at all levels.



drive advisory services and farmers to operationally adopt CSA criteria

Enabling advisory services for climate-smart agriculture

Key elements to foster farmers' adoption of CSA practices



Policy brief

Implementing Climate-Smart Agriculture (CSA) practices requires changes in the behavior and strategy of millions of farmers.

Findings from implementing the Climate-Smart Agriculture Prioritization Framework in Mali



Policy brief

This policy brief summarizes findings of a pilot project aiming to develop a participatory framework to prioritize CSA practices and interventions to guide CSA investments in Mali published in Agricultural Systems.

A Gender-responsive Approach to Climate-Smart Agriculture

Evidence and guidance for practitioners



Climate-Smart Pest Management: Implementation guidance for policymakers and investors



Overview of practice

(CSPM) is a cross-sectoral approach that aims to reduce pest-induced crolosses, enhance ecosystem services, reduce greenhouse gas emissions an strengthen the resilience of agricultus systems in the face of climate change Through the implementation of CSPM farmers, extension workers, researchers, and public and private sector stakeholders will act in coordination to manage changing pesthreats more effectively, and achieve more efficient and resilient food

Supporting agricultural extension towards Climate-Smart Agriculture An overview of existing tools



©FAO/Giulio Napolitano / FAO

Compendium

The Compendium provides examples of more than 20 different approaches of how agricultural extension can support climate-smart agriculture, with contributions from seventeen institutions and over 30 contributors worldwide.



Simone Sala, Federica Rossi, Soniia David (editors)

SECTIONS

Approaches

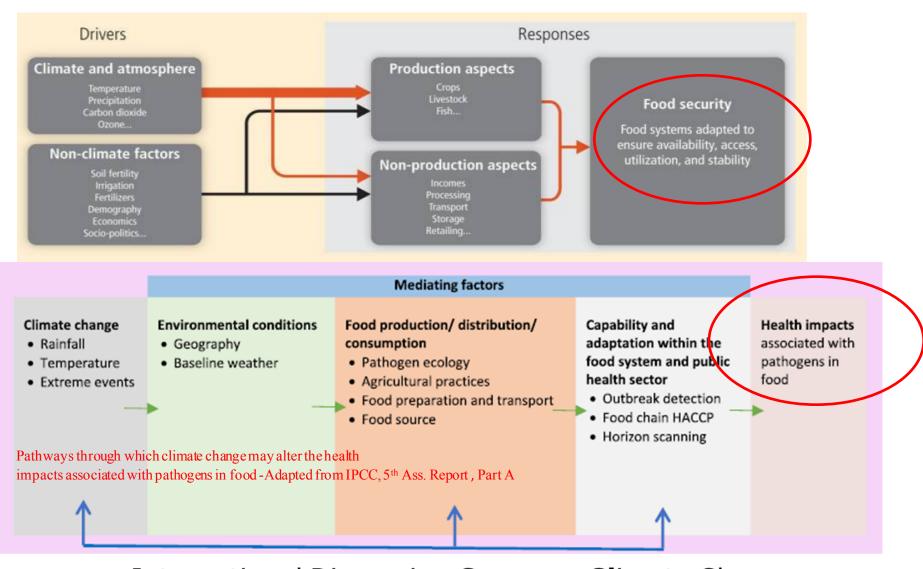
Technology and innovation

Knowledge and Participation

Italian synergies and innovations for scaling-up CSA

Case Study

Food and Agriculture Organization of the United Nations (FAO)



 International Discussion Group on Climate Change and Emerging Risks on Food Safety, CLEFSA



COST 718

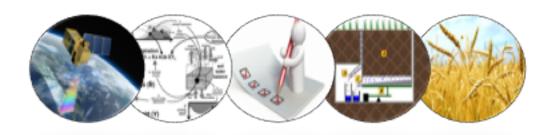




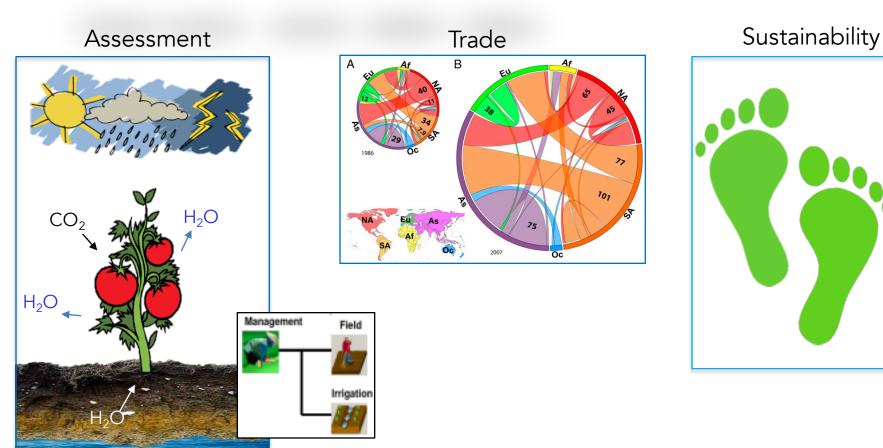
Impacts of Climate Change and Variability on European Agriculture - CLIVAGRI



ES1106- Assessment of EUROpean AGRIculture WATer use and trade under climate change (EURO-AGRIWAT)







The WF seems the best to candidate to play the same role for water management along food chains, than the carbon footprint for climate change mitigation.



European knowledge-innovation community to accelerate the transition to a zero-carbon economy. Partners in business, Academia, public and non-profit sectors network develops and scale-up innovative products, services and systems.

What is CSA Booster?









Climate Smart Agriculture Booster

A Climate-KIC Flagship programme which addresses the climate change mitigation, adaptation in the agriculture sector and the food security.

> Promoting the innovation in the European agricultural sector and catalysing the adoption of CSA solutions







Growing network

2015

2016

2017

2018

2019

2020

Corporates/ Farmers cooperatives





































Solution providers











Academia













Governments & **NGOs**











wetsus













Donors













SUCCESS STORIES

Fruit Value
Chain:
Creating
climate-smart
value chains







Italian Society of Agrometeorology

Croatian Agrometeorological Society

Association of Agrometeorogists of India

Korean Society of Agricultural and Forest Meteorology

Association of Agrometeorology Argentina

Brasilian Agrometeorological Society

Canadian Society of Agricultural Meteorology

Agrometeorological Scientists in Russian Federation

Agro-Eco-Meteorological Society of China

Society of Agrometeorology of Japan

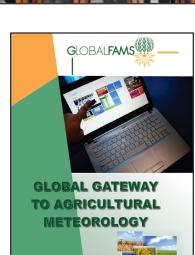
Australian Society of Agricultural Meteorology

Slovak Bioclimatological Society

Hungarian Meteorological Society

Romanian Agrometeorological Society









innovative applications in agrometeorology

India's Integrated Agro-meteorological Advisory Service (IAAS)

The IAAS was introduced in 2007. It involves a wide range of partners, including the India Meteorological Department (IMD), the National Centre for Medium Range Weather Forecasting (NCMRWF), and the Indian Council of Agricultural Research (ICAR) among others.

METEOROLOGICAL SERVICE

provides 5-days weather forecast

ICAR, STATE DEP. OF AGRICULTURE, UNIVERSITIES

translate these into agricultural advisories to alert farmers to weather-related events that are likely to affect their farming operations

FIELD UNITS AT AGRICULTURE UNIVERSITIES

Relay the advisories to farmers in local languages using a variety of channels, including SMS messages on mobile phones, local radio and newspapers, and face-to-face advisory and extension services



KEY LESSONS AND IMPACTS

By combining weather forecasts with agricultural advice, IAAS not only makes farmers aware of extreme weather events but helps them take steps to be prepared.

Studies indicate that IAAS advisories increase yields and lower costs for the millions of smallholder farmers who receive them.

The estimated economic impact since 2007 is more than USD 10 billion.

WHAT MAKES IT CLIMATE-SMART?

FOOD AND INCOME: IAAS advisories encourage farmers to adopt technologies and practices that enhance productivity, reduce costs and increase income.

ADAPTATION: The service provides farmers with accurate information about changing weather patterns and how to cope with them.

MITIGATION: While the focus here is not on mitigation, the advisories have the potential to promote emission-reducing approaches.

The Regional Guidelines for Promoting Climate Smart Agriculture issued by the Association of Southeast Asian Nations (ASEAN) CLIMATE SERVICES are identified as tools to mitigate climate risk in agriculture

Principal components of climate services, applied to the agriculture sector:

- Production and supply of climate information
- Translation of climate data into climate products and services
- Communication of climate information and services
- Use of climate information and services in climate-informed decision-making and climate-smart policy and planning

"...climate information is helping farmers become smarter, productive and efficient..."



in the Eastern Caribbean States

Meeting the Challenges of Climate Change in Grenada through Organic Agriculture

Grenada Organic Agriculture Movement (GOAM)

Mulching and composting
Biochar
Intercropping
Wind breaks
Diversification
Improved water management





By implementing practices that are suitable to adapt to the increase in temperatures and climate variability and the change in precipitation, the farmers have made both their farming systems and their livelihoods more resilient. Improving water management and soil quality, incorporating multistoried intercropping, and protective structures are some of the adaptation measures implemented.



Diversification, improved soil health, and better water and landscape management to address the climate changes have resulted in an increase in yields, a reduction in losses, and an overall increase in production, leading to enhanced incomes and food security for the farmers.



Reduced tillage, incorporation of perennial crops, and the use of biochar help reduce greenhouse emissions by maintaining soil carbon and enhancing carbon sequestration.





Table 3 CSA Practices in Grenada

		Degree of	
System	Practice		
Nutmeg	Restoration of hurricane damaged plantations	3	
Cocoa	Organic cocoa in mixed, multilayer plantations	3	
	Drip feed irrigation	3	
	Solar powered irrigation systems	2	
	Contour ploughing	2	
	Intercropping	3	
	No-burn agriculture, with shredding, composting, mulching	3	
Fruit, Veg, Root crops	Increased cultivation of tubers (hurricane resistant)	3	
	Stabled dairy goats with cut-and-carry fodder production	2	
Livestock	Beekeeping	3	
	Controlled use of agrochemicals	2	
	Organic agriculture	2	
	Water capture and protection of water sources	3	
	Terracing	1	
	Composting organic waste	2	
	Biodigesters	2	
	Drought resistant crops/varieties	2	
	Risk mapping	1	
All agriculture	Micro-level weather insurance 8	1	
	Develop food-processing capacity 9	4	
	Developing sustainable land management capacity	2	
	Integrated watershed management ¹⁰	1	
Sector-wide	Developing management and decision making capacity	2	

Source: Based on information from expert informants and additional sources shown in footnotes

		1 /1 /		
	2	Validation in field trials / small project / new measures being adopted by one or a few		
	2	companies / new ideas being promoted by agencies		
World Danly CIAT, CATIF 2014 Cumplemental	3	Scattered adoption across the sector(s)/ large project / not known - default score		
World Bank; CIAT; CATIE. 2014. Supplemental material to Climate-Smart Agriculture in El Salvador.		Widespread adoption		
		80 to 100% adoption		
CSA Country Profiles for Latin America Series.				
Washington D.C.: The World Bank Group.				

Score | Criteria for practices

Suggested by interviewee as a good idea Research and development / policy commitment

Thank you

...resilience!

